



MENU

[Results for UAV-BASED PHO... >](#)

UAV-Based photogrammetry for cultural heritage mapping and 3D modellin...

[Free Full Text From Publisher](#)[Export ▾](#)[Add To Marked List ▾](#)

&lt; 1 of 1 &gt;

# UAV-Based photogrammetry for cultural heritage mapping and 3D modelling of Kota Lama Duyong, Terengganu

By

[Are you this author?](#)

[Choy, LK](#) (Choy, Lam Kuok) <sup>[1]</sup>; [Ja'afar, NH](#) (Ja'afar, Nor Haslina) <sup>[2]</sup>; [Malek, MIA](#) (Malek, Mohd Iskandar Abdul) <sup>[2]</sup>; [Harun, NZ](#) (Harun, Nor Zalina) <sup>[3]</sup>; [Wahab, AA](#) (Wahab, Alisa Abdul) <sup>[4]</sup>; [Zakariya, K](#) (Zakariya, Khalilah) <sup>[5]</sup>; [Hanim, A](#) (Hanim, Aajirah) <sup>[1]</sup>; [Muhammad, FN](#) (Muhammad, Farah Nuralissa) <sup>[1]</sup>

[View Web of Science ResearcherID and ORCID](#) (provided by Clarivate)

Source

[GEOGRAFIA-MALAYSIAN JOURNAL OF SOCIETY & SPACE](#)[← View Journal Impact](#)

Volume: 22 Issue: 2 Page: 1-15

DOI: 10.17576/geo-2026-2202-01

Published

MAY 2026

Indexed

2026-07-18

**Document Type** Article

**Abstract**

Cultural heritage buildings are increasingly exposed to environmental degradation, urban development and inadequate documentation, creating an urgent need for efficient and accurate digital preservation approaches. This study examines the application of Unmanned Aerial Vehicle (UAV) based photogrammetry for three-dimensional (3D) documentation and visualization of Kota Lama Duyong, a historically significant heritage structure located in Kuala Terengganu, Malaysia. UAV image acquisition was carried out using a DJI Mavic 2 Pro through automated double grid and circular flight missions to ensure sufficient image overlap and comprehensive coverage in a spatially constrained environment. A total of 180 aerial images were processed using Agisoft Metashape Professional, employing Structure-from-Motion (SfM) and Multi-View Stereo (MVS) techniques to generate sparse and dense point clouds, polygonal mesh models, textured 3D surfaces and orthoimages. The results demonstrate that UAV-based photogrammetry can produce geometrically coherent and visually detailed 3D models suitable for cultural heritage documentation, visualization and digital archiving, even under challenging site conditions. Minor geometric distortions were observed in areas affected by vegetation and infrastructural obstructions; however, the overall model quality remains adequate for heritage recording purposes. This study confirms that UAV photogrammetry represents a cost-effective, flexible and practical solution for heritage digitization and contributes region-specific empirical evidence to support the integration of UAV-derived 3D models into GIS-based cultural heritage management and conservation frameworks.

**Keywords**

**Author Keywords:** [GIS](#); [heritage building](#); [Kota Lama Duyong](#); [photogrammetry](#); [UAV mapping](#)  
**Keywords Plus:** [TECHNOLOGIES](#)

**Author Information**

Corresponding Address: Choy, Lam Kuok (corresponding author)  
▼ Univ Kebangsaan Malaysia, Fac Social Sci & Humanities,  
Geog Program, Bangi, Malaysia  
E-mail Addresses :  
[lam@ukm.edu.my](mailto:lam@ukm.edu.my)  
Addresses :

- ▼ <sup>1</sup> Univ Kebangsaan Malaysia, Fac Social Sci & Humanities, Geog Program, Bangi, Malaysia
- ▼ <sup>2</sup> Univ Kebangsaan, Fac Engn & Built Environm, Dept Architecture & Built Environm, Bangi, Malaysia
- ▼ <sup>3</sup> Univ Kebangsaan Malaysia, Inst Malay World & Civilizat ATMA, Bangi, Malaysia
- <sup>4</sup> Lembaga Muzium Negeri Terengganu, Bukit Losong, Kuala Terengganu, Malaysia
- ▼ <sup>5</sup> Int Islamic Univ Malaysia, Kulliyyah Architecture & Environm Design, Serdang, Malaysia

E-mail Addresses :

[lam@ukm.edu.my](mailto:lam@ukm.edu.my)

### Categories/ Classification

Research Areas: Social Sciences - Other Topics

Citation  
Topics: [4 Electrical Engineering, 4.169](#) [4.169.1045 Lidar](#)  
[Electronics & Computer Science](#) > [Remote Sensing](#) > [and Photogrammetry](#)

Sustainable Development Goals: [15 Life on Land](#)

### Web of Science Categories

[Social Sciences, Interdisciplinary](#)

### Funding

▼ [View funding text](#)

| Funding agency                                 | Grant number               |
|------------------------------------------------|----------------------------|
| <a href="#">Universiti Kebangsaan Malaysia</a> | <a href="#">UKM-TR-017</a> |

+ [See more data fields](#)

### Journal information

## GEOGRAFIA-MALAYSIAN JOURNAL OF SOCIETY &amp; SPACE

0.19

[← View Journal Impact](#)Journal  
Citation  
Indicator™  
(2025)

ISSN 2180-2491

eISSN 2682-7727

**Current Publisher** UNIV KEBANGSAAN MALAYSIA, FAC SOCIAL SCIENCES & HUMANITIES, UNIV KEBANGSAAN MALAYSIA, FAC SOCIAL SCIENCES & HUMANITIES, BANGI, SELANGOR 43600, MALAYSIA

**Research Areas** Social Sciences - Other Topics

**Web of Science Categories** Social Sciences, Interdisciplinary

## Citation Network

In Web of Science Core Collection

0 Citations

[Create citation alert](#)

23

Cited References

[→ View Related Records](#)

How does this document's citation performance compare to peers?

## Use in Web of Science

2

Last 180 Days

2

Since 2013

[Learn more →](#)

## This record is from:

## Web of Science Core Collection

- Emerging Sources Citation Index (ESCI)

## Suggest a correction

If you would like to improve the

quality of the data in this record,  
please [Suggest a correction](#)

← [Open comparison metrics  
panel](#)

Data is from InCites Benchmarking &  
Analytics

## 23 Cited References

[View as set  
of results](#)

Showing 23 of 23

*(from Web of Science Core Collection)*









